THE PLANT DISEASE BULLETIN

LIBRARY
RECEIVED
★ SEP 2 5 1921 ★
U. S. Department of Agriculture

Issued By

THE PLANT DISEASE SURVEY

Volume V Number 6

September 15, 1921

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE BULLETIN

Issued by

THE PLANT DISEASE SURVEY

Vol. 5. September 15, 1921 Number 6

CONTENTS

Cereal and Forage Crops..... 91
Wheat..... 91
Corn..... 91
Red clover..... 93
Fruit Crops..... 93
Apple..... 93
Peach..... 98
Pear..... 99
Vegetable and Field Crops..... 99
Potato..... 99
Bean..... 101
Rhubarb..... 102
Cucumber..... 102
Cotton..... 103
Tobacco..... 106

Ergot of wheat exceptionally bad in parts of North Dakota. (Page 91).

Epiphytotic of corn smut in South Dakota. The disease is also abundant in certain other sections this year. (Page 92).

Economic importance of corn mosaic in Hawaii as reported by L. O. Kunkel. (Page 92).

A bacterial stalk rot of corn reported by D. C. Neal from Mississippi. (Page 92).

Powdery mildew of pear outbreak in Central Washington reported by D. F. Fisher. (Page 99).

A Phytophthora disease of rhubarb in Tennessee. (Page 102).

A disease resembling mosaic in some respects but differing from it in others reported on tobacco from Kentucky. (Page 107).

An undetermined leaf wilt of tobacco reported from Kentucky by Valleau. (Page 107).

CEREAL AND FORAGE CROPS

WHEAT

Ergot caused by Claviceps purpurea.

Reports and wheat samples have recently been received from Towner and Ramsey Counties, North Dakota indicating an unusual amount of ergot in the wheat of those sections. Farmers and millers are inquiring as to the consequences of using infested grain for flour or feed and of the utilization of the straw by horses and cattle. Inspection in the Cereal Office at Washington, of a wheat sample from Newville, North Dakota, showed one of the highest percentages of ergot infestation in wheat ever observed by members of that office.

CORN

Smut caused by Ustilago zeae.

The outstanding report on corn smut is that which is given below from South Dakota. In that state the disease is exceedingly destructive this year being the worst ever reported to the Survey. No reports from other Plains States are at hand so that the extent of the area involved in the epiphytotic is not known. However, the observations of C. G. Woodbury given below show that the disease is bad in parts of Minnesota and Iowa. In the east, in the Virginias and Carolinas, reports indicate a superabundance of infection, but in a number of other states smut appears to be about normal.

Massachusetts: About the usual amount, not over .5%. (Osmun, September 1).
Connecticut: Seems to be more prevalent than usual. (Clinton, September 1).
New Jersey: Not severe. (Cook, September 1).
Virginia: Seems to be more prevalent than usual but percentage of ears affected is not high. (Fromme, September 1).
North Carolina: Very common and destructive this year. Cases of infection as high as 15% of stalks by actual count. (Foster, September 1).
South Carolina: Infection general and apparently more abundant than usual. One farmer estimated his loss at 5%. (Ludwig, September 1).
Louisiana: Very scattering this season. (Edgerton, September 1).
Ohio: Common throughout state but less abundant than in 1920. (Detmers, September 1).
Wisconsin: A large amount of smut on both sweet and field corn this year. More than has been reported for several years. (Vaughan, September 1).
Minnesota and Iowa: Prof. C. G. Woodbury, recently returned from a trip including Minnesota and Iowa points, reports that he and Mr. Cosgrove, of the Minnesota Valley Canning Company of Le Sueur, Minnesota, found smut doing important damage to sweet corn in the vicinity of Le Sueur, Minnesota, where practically the only sweet corn variety grown is that known as Crosby. The corn smut attack is not uniformly severe, since some fields were found to be clean. In others, however, rather high percentages of infection were noted. In one particular 60-acre field of Crosby sweet

corn they made careful estimates and agreed that there was at least 25% actual loss from smut.

Near Des Moines, Iowa, smut is very prevalent in some fields of sweet corn, apparently more abundant than usual. As in the case of Minnesota, referred to above, other fields were noted that were free from smut. (A. G. Johnson, August 19).

South Dakota: This disease is very widespread and exceedingly severe in South Dakota this year. Many fields run as high as 60-70%, by actual count. Scarcely a field has less than 10%. Where the ear is affected, of course, it is usually a total loss. I feel sure that the loss in corn from smut alone will be 15%. Many farmers have even sold their hogs, anticipating that they will not raise enough corn to feed them. You may gain some knowledge of the prevalence of the severity of this disease when I say that for the past month we have gotten from one to three inquiries in practically every mail from all localities in South Dakota. (Evans, August 20).

Mosaic (cause unknown).

L. O. Kunkel, who has recently reported on a possible causative agent for corn mosaic (Hawaiian Sugar Planters Exp. Sta. Bul. 3, July 9, 1921) has also sent in the following note on the seriousness of the disease in Hawaii (Office of Cotton, Truck, News Notes. August 6, 1921).

"I have been somewhat interested in the mosaic disease of corn during the past year. This disease is much more serious on corn than is the yellow stripe disease of sugar cane. Mosaic under Hawaiian conditions is a dangerous disease. I recently visited one of the corn growing regions on Waui and found mosaic in every field visited. In some places it was doing considerable damage. In one field of several acres I was unable to find a single healthy stalk. I note that mosaic is present on corn in some of the southern states. It is one of the diseases that should be kept under observation. If it should spread to the corn growing regions of the Middle-west and should there become one-half as destructive as it is in Hawaii, it would be a calamity."

Head smut caused by *Sorosporium reilianum*.

Washington: Head smut of corn has been found around Pullman in several fields. I was in one field that had about 20% infection. In some smut samples recently sent in from Outlook, Yakima County, we found one tassel and one ear infected with head smut. This is the first time that head smut has been reported from Yakima. There is considerable corn raised in this part of Yakima County. (Zundel, September 3).

Bacterial wilt caused by *Bacterium stewartii*.

Eight eastern states report that no bacterial wilt has been observed to date. The only affirmative report is one from Fromme in Virginia who states that Golden Bantam at Blacksburg and Roanoke showed the disease more than other varieties and in one case at least the early plantings were more seriously attacked than the late ones.

Brown spot caused by Physoderma zeae-maydis.

South Carolina: General, but varying in abundance. Damage apparently not great. (Ludwig, September 1).

Florida: I have noticed in Alachua County some fields were so badly affected that many stalks were broken off by the wind where the organism had weakened the tissues. The Agent from Duval County reports that the disease is very bad in that county. From Gadsden County, I have the report that the disease is far worse than was at first suspected. A farmer was in the office recently and said that he would have to quit growing corn if the disease could not be controlled. It has been getting steadily worse for the last three years. (Burger, August 16).

Alabama: Whereas last year in the vicinity of Mobile, Alabama certain growers lost their entire corn crop, the season this year has not been so favorable to the development of this disease and the damage from it is practically negligible. (Povah, August 15).

Bacterial stalk rot.

A stalk rot of corn apparently the same as that in Arkansas has been reported by D. C. Neal of Mississippi as follows:

"Specimens of corn were received recently from Pearl River County which appear to be infected with a bacterial stalk rot. The material was cultured and the organism isolated. The host symptoms tally very closely with Rosen's description of the disease in Arkansas. The grower reports 5% loss in a very small planting. He also states that the same trouble was present last year. Investigation of the disease is being continued in order to establish with certainty the exact cause. However, I feel sure that this is the true "nodal-rot" reported in Arkansas by Rosen and later in Louisiana by Edgerton."

RED CLOVER

Powdery mildew caused by Erysiphe sp. (conidial form) has been unusually common in many parts of the East this year. At least reports from New York, New Jersey, Pennsylvania, Maryland, District of Columbia, and Virginia point that way. Any information readers of this bulletin may have throwing further light on destruction, severity, etc. will be appreciated.

FRUIT CROPS

APPLE

Scab caused by Venturia ineaqualis.

The following individual state reports on the apple scab situation are

very much alike as the majority of them emphasize the short apple crop, failure of growers to spray after the spring freezing injury, very heavy foliage infection, and the effect of this on next year's crop.

Massachusetts: Worse this year than usual in all parts of the state. The McIntosh variety is most severely attacked. The first ascospores were discharged April 25, and the last June 13. The heaviest discharge of ascospores was between April 27 and May 4. The pink spray was the most important. (Krout, September 1).

Connecticut: The worst I have ever seen it in the state. Recently, however, it has not spread further. (Clinton, September 1).

New Jersey: Severe in some localities, very little in others. (Cook, September 1).

Delaware: Leaf infection first observed Apr.21 on Staymans, 75% infection on Early Ripe. Leaf infection very prevalent because of neglected spraying. Trees bearing no fruit in many cases received no spray after the pink. Fruit infection generally prevalent. The irregular setting of fruit did not receive consistent protection in early stages of development even where the regular spray schedule was given. (Adams, July 15).

West Virginia: Quite prevalent in most sections of the state. It has not caused very heavy fruit losses in the state this year but it has weakened many trees for production next year and is also producing much infectious material which will likely cause trouble next spring. It has been readily controlled in sprayed orchards and we have had fair success with dust. The general fruit crop is light. (Giddings, September 1).

Virginia: Have had only one complaint of scab on fruit, and have seen but very little fruit generally. Foliage infection was general, however. I am inclined to think that fruit infection, where fruit is found, will be less severe than last year. The presence of scab on fruit will not affect the sale much as almost anything is bringing a good price on local markets. (Fromme, September 1).

South Carolina: Practically no scab in this section. (Ludwig, September 1).

Mississippi: Inquiries and specimens have been received from Jackson, in Hinds County, and Ashland in Benton County. Considerable loss reported. Fruit unsprayed. (Miles, September 1).

Arkansas: Very heavy leaf infections because of lack of spray applications. (Rosen, September 1).

Ohio: The season of 1921 in Ohio has shown more than normal infection from apple scab. While the late freezes destroyed a heavy portion of the crop in southeastern district where scab susceptible varieties are grown to a very large extent, scab infection has extended over practically the whole state. A tendency to quit spraying after the freezing has left many orchards without protection and resulted in very severe infections on both fruit and foliage for the midsummer period. These infections are not so marked in southeastern Ohio, possibly due to high temperatures and light rainfall during the usual period of disease spread. The need for pre-blossom spray of Bordeaux mixture brought out locally in the northern half of the state for 1920 has been exemplified over practically all of the state. Emphasis is laid upon this pre-blossom application of stronger Bordeaux mixture, both for the efficiency in scab control and for its usefulness in orchard sanitation practice. While with good care as to sanitation the applications of lime sulphur have proved satisfactory, where a real problem of scab control is presented we have found no other spray comparable to this in efficiency and certainty. (Selby, September 1).

Ohio: Scab has ruined, at least for market purposes, much of the crop in northern Ohio. The leaves all over the state are heavily infected and since these

leaves are the means by which the disease over-winters, there probably will be heavy infection of the young fruit next spring. This year has shown again that the pink spray is the important one for scab control. One trial comparing Bordeaux and lime sulphur sprays indicated that the Bordeaux was superior. (Clayton, August 15).

Illinois: Very bad on foliage. Late infection bad on account of cool August. Disease unusually severe due to the fact that few growers continued to spray after the fruit was killed. Defoliation has resulted in many orchards. (Anderson, September 1).

Wisconsin: Less scab than usual. The sprayed orchards of Door County are very free from scab. The frost wiped out the crop in south and southwest portions. (Vaughan, September 1).

North Dakota: Apple scab has not been pronounced and has only been collected once to our knowledge during the year. This specimen was found near Beach in Golden Valley County. (Bolley, September 1).

Montana: More or less common. Considerable damage done in orchards not sprayed. (Jennison, August 15).

Fire blight caused by Bacillus amylovorus.

A wide and rather general distribution but not heavy losses are indicated by the accompanying collaborators' reports on fire blight occurrence.

Massachusetts: Very prevalent in certain parts of the state while in other parts not observed. (Krout, September 1).

Connecticut: More prevalent than in average years; bad in a few cases. (Clinton, September 1).

New Jersey: About the usual amount. (Cook, September 1).

Delaware: First observed May 19, on Yellow Transparent. Twig blight is generally prevalent in state on this variety. (Adams, July 15).

West Virginia: Has caused trouble only in occasional orchards and apple trees in town. (Giddings, September 1).

Virginia: Not at all epidemic but a fair sprinkling occurs in the state this year and is occasionally found quite severe. (Fromme, September 1).

South Carolina: A little worse than usual. (Ludwig, September 1).

Tennessee: (East Tennessee) Fire blight of twigs and fruit in a few cases was very damaging. (Sherbakoff, August 11).

Mississippi: Inquiries regarding the disease have been received from eight counties: Smith, Clark, Hinds, Benton, Washington, Marshall, Harrison, and Tippah. More severe on pear, but causing considerable injury to apple. (Miles, September 1).

Louisiana: Very few apples in state but have had a couple of reports of blight. (Edgerton, September 1).

Ohio: The extension of fire blight infection since July 1 has apparently been somewhat restricted and more recent investigations by R. C. Thomas indicate very general and almost immediate infection by black rot, Sphaeropsis malorum, following fire blight. Indeed, the later scattering of twigs raises the question as to whether some of this initial invasion and killing of twigs is not to be acredited to Sphaeropsis (See black rot). "Throughout my entire trip I was very much impressed with the amount of twig blight. The organism ostensibly present was the black rot fungus. The question arises as to whether black rot is the primary cause of whether fire blight followed by black rot has been the logical manner of attack."-Thomas. (Selby, September 1).

Ohio: The fire blight attack seems to have been checked materially by the dry weather of the past month. (Clayton, August 15).

Illinois: Very serious in northern sections of state on susceptible varieties. Little damage on account of light crop. (Anderson, September 1).

Wisconsin: More fire blight than for several years. Some large growers have pruned out blighted twigs already and hope to control the spread of infection. (Vaughan, September 1).

North Dakota: Not particularly destructive this year. Dry weather conditions which have prevailed throughout the summer have apparently prevented excessive growth with the result that fire blight has not done the usual amount of damage to apple trees. (Bolley, September 1).

Montana: More common than for two or three years past. From 5-15% damage depending upon varieties and care. (Jennison, August 15).

Washington: Moderate to severe in the White Salmon section. No reports from other parts of the state. (Dana, September 1).

Blotch caused by Phyllosticta solitaria.

The blotch situation in Ohio as reported below by A. D. Selby is of especial interest.

Delaware: Canker infection very severe on Duchess in some sections. Fruit and leaf infection first observed June 26. Very severe, as trees received only dormant and pink spray. (Adams, July 15).

Tennessee: Common, East Tennessee. (Sherbakoff, August 11).

Mississippi: Specimens from Terry in Hinds County. Trees not sprayed. Severe injury reported. (Miles, September 1).

Louisiana: Very common and severe on the few apple trees that occur in this state. (Edgerton. September 1).

Ohio: Apple blotch has heretofore been looked upon as a disease prevalent or dangerous only in the southern half or even in the southeastern portion of the state. The season of 1921 has proved the danger of this viewpoint. Under the practice of the omission of pre-blossom or midsummer applications of copper sprays along with the known tendency towards dispersal of spores the disease has advanced practically across the whole of Ohio, while according to the susceptibility of varieties and the conditions as to origin and treatment of trees makes for sharp variations. Investigations since July 1 have brought the blotch invasion northward sharply into view. As reported July 1 specimens have been studied from many additional counties and recent collections in Wayne, Lucas, Ashland, have pointed to the real arrival of this orchard parasite at the northern boundaries of the state. The sharpest illustration has been shown in Lucas County where on August 6 R. C. Thomas investigated certain orchards of the Jonathan variety which had received dust applications. The dusts included both compounds of lime sulphur and those containing dehydrated copper as dust. Mr. Thomas found that 95% of the leaves were infected. Apple scab was everywhere prevalent but apple blotch was the serious leaf parasite. On this variety, Jonathan, little fruit infection was found. The inefficiency of the dusts to control diseases was sharply exhibited. (Selby, September 1).

Illinois: Worse than usual in the few orchards which escaped freeze. This due to failure to spray on account of light crop. (Anderson, September 1).

Black rot caused by Sphaeropsis malorum.

Massachusetts: Black rot very prevalent in most sections of the state. The Baldwin variety most severely attacked. (Krout, September 1).

Delaware: Frog-eye infection very prevalent April 29. Many orchards showed early defoliation the last of July. More prevalent than usual because of neglected spraying. Black rot infection common because of much side worm injury. (Adams, July 15).

Virginia: Foliage conditions of apples is very bad generally, due to frog-eye, dry weather and scab, also cedar rust in some sections. Many complaints of frog-eye have been received. This was anticipated when fruit growers omitted spraying after the frost damage. Injury to next year's crop will no doubt be considerable. (Fromme, September 1).

Ohio: Next to apple scab the infection of apple twigs, leaves and fruit from black rot and blotch over practically the entire state has been the striking feature of the season. Black rot cankers are so much in evidence and the Sphaeropsis malorum so closely follows fire blight or other dying of twigs as to make a real black rot problem. It seems also that where Bordeaux mixture has been omitted in the spray program of the orchards there has been a marked tendency to increased infection of both black rot and blotch. This infection has been so marked, indeed, as to constitute a real menace to apple orchards where the strong fungicides have been omitted in the spraying program. We have been compelled in Ohio to recommend and to practice applications of copper sprays in foliage during midsummer. (See blotch) (Selby, September 1).

Frog eye leaf spot has practically defoliated many unsprayed orchards in southern Ohio. This trouble seems to be most severe in orchards lacking proper fertilization and cultural care. (Clayton, Aug. 15).

Illinois: Frog-eye on foliage serious in southern portion of state and on fruit when present. This is the worst infection experienced in several years. (Anderson, September 1).

Cedar rust caused by Gymnosporangium juniperi-virginianae.

Virginia: Attracting unusual attention in Piedmont section - Amherst, Nelson, and Albemarle Counties. (Fromme, September 1).

West Virginia: Very little injury as reported early. (Giddings, September 1).

Powdery mildew caused by Podosphaera leucotricha.

Delaware: Very severe on one block of Jonathan, April 21. Leaf shoots severely infected. Retarded growth indicates bud infection as described by Fisher. (Adams, July 15).

Tennessee: Powdery mildew was found to be causing apparently a considerable loss near Cleveland. (Sherbakoff, August 11).

California: Observed on apple trees. Considerable defoliation of twigs. The mildew is general in the Pajaro Valley this year, but in spite of this there will be a fair crop of apples harvested as apparently only terminal shoots were defoliated. (Fields, August 22).

Bitter rot caused by Glomerella cingulata.

Bitter rot has been reported from a number of the southern states where there is any crop. More than the usual percentage has been observed in Illinois.

Superficial bark canker caused by Myxosporium corticolum was reported by Krout as very common this year in Massachusetts.

York spot or drought spot was observed in Delaware the first of August in a block of York Imperials, causing 5% injury according to Adams.

Copper injury was reported by Adams of Delaware as causing considerable leaf injury and defoliation in many orchards where Bordeaux spray was used. Williams variety of apple very susceptible to leaf injury. Bordeaux russeting from summer spray very severe on Ben Davis.

Arsenical injury at blossom end and on foliage has been further reported by Selby of Ohio since July 1, thus indicating the need of greater care in the amounts of arsenate of lead employed in the sprays following the calyx cup period.

PEACH

Brown rot caused by Sclerotinia cinerea.

Massachusetts: Observed in a few orchards July 15. There will be a fair crop of peaches in the state, and the damage may be heavy. (Krout, July 1).

Tennessee: (East Tennessee) Brown rot of fruit very serious; brown rot twig blight in some cases causing considerable damage. (Sherbakoff, August 11).

Illinois: No peaches in state this year, so disease not very destructive. Market peaches from Georgia and other southern points have had less than the usual amount of brown rot this season. (Anderson, August 15).

Scab caused by Cladosporium carpophilum.

Scab is said to be present in about the usual amounts in Massachusetts and Connecticut.

Illinois: Market peaches have shown considerable scab, especially those from Texas. Twig infection is worse than usual this year. (Anderson, August 15).

Black spot caused by Bacterium pruni.

Connecticut: A little but no serious damage. Probably more than average years. (Clinton, August 15).

Ohio: Reported in limited amount with rather restricted injury. Growth of late foliage generally good but restriction of crop to the lake and island districts has led to limited interest in peach orchards and their troubles. (Selby, August 15).

Illinois: Very bad on foliage in southern sections of the state. It developed late in the season but will probably reduce the number of fruit buds considerably. (Anderson, August 15).

PEAR

Powdery mildew caused by Podosphaera leucotricha.

An unusual outbreak of powdery mildew on pears in central Washington has been reported by D. F. Fisher of the United States Department of Agriculture. Fisher's report was sent from Wenatchee, Washington, September 8.

> "Very general and severe on Idaho, Anjou, Bartlett, and Louise Bonnie. Less severe on Flemish Beauty and Winter Nelis, latter very resistant. Many Anjou crops reduced 50-75% and remaining fruit badly russeted and scarred. On this variety the scars resemble early scab infection. Idahos often completely covered with russet and greatly stunted in size. All affected pears are reduced in market grade. Fungus makes a sparse growth on foliage and twigs but apparently does not stunt growth or as seriously devitalize the tree as on apples. Affected leaves are russeted on the under side and become cupped or curled and eventually drop. Perithecia have been found on pear fruit but not on twigs.
>
> "This is the first time the disease has been serious or at all widespread on pears even on pear trees interplanted with mildewed apple trees. The fungus was well established before its prevalence was observed, and consequently no control measures were undertaken this year."

VEGETABLE AND FIELD CROPS

POTATO

Late blight caused by Phytophthora infestans.

Late blight is practically absent from New England this year according to several recent reports just received from collaborators and others there. Only traces have been observed in Maine to date so that the probabilities of that important potato state escaping blight damage are exceptionally good. In New Hampshire they have been on the watch for it but none has been seen. However, Gilbert in Vermont has located a couple of inactive infection centers.

In Pennsylvania and the mountain sections farther south where considerable of the disease appeared earlier in the season it has not been making rapid progress owing to hot, dry weather.

Vermont: We have recently observed a little late blight in several isolated sections of the state. In the Connecticut River Valley near Brattleboro, there has been general infection of several fields. In Orange County we have seen light infections in one or two fields. These latter seemed to originate at the time of rains, but, dry weather coming on, the blight was checked and has not progressed since. In the Brattleboro case I believe that the infection has been brought on by the heavy mists which have been prevalent there recently. (Gilbert, September 8).

Massachusetts: Not reported this season. (Osmun, September 1).

Connecticut: Have been unable so far to find a single specimen. (Clinton, Sept. 1).

New Jersey: None. (Cook, September 1).
West Virginia: Quite prevalent in the central, eastern, and south-eastern parts of the state. Aside from Randolph and Tucker Counties the amount of injury is likely to be slight as dry weather has been prevailing recently and has killed out most of the disease. (Giddings, September 1)
Ohio: Apparently none present this year. Weather conditions thus far unfavorable to its development. (Detmers, September 1).
Wisconsin: No cases seen or reported. There is a very heavy vine growth in northern fields of Green Mountains which may develop blight later. (Vaughan, September 1).

Tip-burn (non-parasitic)

Massachusetts: Serious and general especially on early varieties. (Osmun, September 1).
West Virginia: Unusually severe and destructive. Estimated reduction in yield probably more than 30%. Leaf hoppers very abundant and apparently associated. (Giddings, September 1).
Ohio: Tip-burn is causing more damage at present than any other trouble. Between drought and tip-burn, the crops in central and southern Ohio have been practically a failure. In northern Ohio the early potatoes have suffered severely, but the trouble is not yet prevalent on the late crops. Leaf hoppers, which transmit this trouble, are very abundant in the fields of late potatoes. (Clayton, August 15).
North Dakota: Tip-burn rather common. In association with heat during late June and early July, appeared to result in a good deal of destruction. Do not think there is any indication that this disease is particularly associated with the attack of leaf hoppers. No doubt these insects increase the destruction. It seems to be wholly associated with some root trouble which causes the plants to fail to furnish sufficient water to meet the transpiration taking place on the marginal points of the leaf and particularly from the water pores. It is naturally pronounced in its destruction at times when transpiration is excessive and moisture is deficient. (Bolley, September 1).
South Dakota: Tip-burn of potatoes has been exceedingly bad in this state and has done a great deal of harm. The potato crop will be very short, due largely to the drouth, together with severe tip-burn. (Evans, August 20).

Mosaic (cause unknown).

Further reports on potato mosaic have been received as follows:

Massachusetts: Especially noticeable in fields where homegrown seed was planted. In one plot from Maine seed 75%. (Osmun, September 1).
Connecticut: Not very conspicuous this year. (Clinton, September 1).
New Jersey: Less than usual. Five per cent or less. (Cook, September 1).
Wisconsin: Less mosaic than for several years, seems to be associated with lack of aphis to spread infection. Triumph variety continues to show greatest amount of infection. (Vaughan, September 1).

Black leg caused by Bacillus phytophthorus.

Wisconsin: Only three specimens found all summer. No practical damage this year. (Vaughan, September 1).
Montana: Widespread and commonly seen. Next to the mosaic disease it is the most significant disease of the crop in non-irrigated sections. Estimate 2-3% damage to crop. (Jennison, August 15).
Colorado: This disease has been reported as quite prevalent in one potato section. (Learn, August 1).

Early blight caused by Macrosporium solani.

Numerous reports concerning early blight indicate that the disease is of only very slight importance this year.

Stem rot caused by Rhizoctonia solani.

Washington: Rhizoctonia is giving more trouble this year than usual (in Yakima Valley). This is dependent, I find, on two factors, first upon the quality of seed used, and second upon the time of planting. I find that potatoes planted from the latter part of April up to and including the middle of May are diseased ranging as high as 80% Rhizoctonia. Potatoes planted after May 15 and up to and including the fore part of June show very little disease. (Zundel, August 23).

Bacterial wilt caused by Bacillus solanacearum.

Florida: Last spring and winter was warm and the Bacterial wilt was very severe throughout the state. In the Hastings district 85% of the fields were badly infested. Reports from the market showed also that slimy soft rot was present. Bacterial wilt may be a cause of slimy soft rot. Some sprayed fields showed that Bordeaux is able to check this disease. (Burger, July 1).

BEAN

Diseases of bean are apparently of much less importance this year than is usually the case.

Anthracnose caused by Colletotrichum lindemuthianum - reported as unimportant in Tennessee and Wisconsin.

Bacterial blight caused by Bacterium phaseoli - said by Sherbakoff to be common and causing about 5% damage in the vicinity of Chattanooga, Tennessee; also reported from Wisconsin.

Rust caused by Uromyces appendiculatus - reported by Ludwig of South Carolina as fairly common in the Piedmont and adjacent sections. He has received no data as to the susceptibility of varieties except that the White Kentucky Wonder is susceptible to some extent. Sherbakoff reported some rust on bush and pole varieties in the vicinity of Chattanooga, Tennessee; more severe on the latter, the damage was slight.

Mosaic (cause undetermined) - reported as unimportant in Massachusetts and Wisconsin; and by Sherbakoff as affecting about 3% of the plants in the vicinity of Chattanooga, Tennessee.

Stem rot caused by Sclerotinia libertiana - reported locally in the central part of West Virginia. Stem rot caused probably by Fusarium sp. was reported by Sherbakoff as causing about 2% damage in the vicinity of Chattanooga, Tennessee.

RHUBARB

Crown rots caused by Phytophthora spp.

The disease recently described by W. S. Beach (Phytopath. 11: 55-56. 1921) is again common this year in Philadelphia County, Pennsylvania. A similar, but probably not identical disease has just been reported to the Survey by C. D. Sherbakoff of Tennessee. This trouble more closely resembles the disease being studied by Godfrey of the United States Department of Agriculture. Regarding it Sherbakoff says:

> "Rot of leaf stalks and leaf spot of rhubarb caused by a Phytophthora closely resembling Phytophthora terrestris (at the present time the writer is by no means certain of the identity of the two fungi, except that they resemble each other in their gross morphology and in their pathogenicity in regard to rhubarb and tomato). The disease of rhubarb was found on June 25 in a section of the city (Knoxville) known as Island Home, side by side with a tomato field affected with buckeye rot. There are strong indications that this disease of rhubarb is not uncommon in many places around Knoxville and that it is also present in West Tennessee. Nearly three-quarters of the patch of rhubarb where the disease was first found is at present killed by it and the ramaining plants are also threatened."

Collaborators are urged to report any cases of this disease as the geographical distribution of these troubles should be worked out and the relations between these tomato and rhubarb fungi established.

CUCUMBER

Bacterial wilt caused by Bacillus tracheiphilus.

Bacterial wilt is reported as having been severe in Ohio, and, for the first time in several years, in Wisconsin.

Ohio: This wilt has been severe and losses heavy. First observed June 15, central and southern Ohio. (Clayton, August 15).

Wisconsin: Bacterial wilt in Wisconsin was more severe than in any year since 1916. Fields visited through the state averaged 4-6% wilt up to August 25, several fields showing 20-30% of wilted plants. The first season in several years in which B. tracheiphilus has been of serious importance in the state. (Doolittle, September 1).

Mosaic (cause undetermined).

Wisconsin: Mosaic in 1921 did less than 30% of the damage that was suffered from this disease in 1920. Initial infection appeared in July in about the same number of fields as in other seasons but owing to a reduced number of aphids the disease spread with much less rapidity than 1920. Many districts which produced practically no crop as a result of mosaic in 1920 secured a fair crop this year. (Doolittle, September 1).

California: Mosaic in all greenhouses during winter season, January to June. Three per cent loss in plants. Considerable more in fruit. Field condition not determined up to date. (Milbrath, July 15).

Angular leaf spot caused by Bacterium lachrymans.

During the early part of the year this disease caused considerable damage in the cucumber-growing sections of Florida, according to the News Notes of the Office of Cotton, Truck, and Forage Crop Disease Investigations for March 2.

Wisconsin: Angular leaf spot did not appear to any extent in Wisconsin until mid-August owing to continued dry weather. On September 1 the disease was present in about 10% of the fields visited, about 30-50% of the plants in these fields were affected to some extent. No serious losses from the disease. (Doolittle, September 1).

California: July 1, severe on Klondyke variety in San Diego County. Crop at peak of season on this date. Thirty per cent affected severely. (Milbrath, July 15).

Anthracnose caused by Colletotrichum lagenarium - according to Doolittle was noted in only two fields in Wisconsin up to September. Both fields were located near Madison, no serious damage.

Downy mildew caused by Pseudoplasmopara cubensis - reported by Doolittle in two fields at Rockland (Monroe County) in western Wisconsin. Disease just appearing on August 25. This was the first time the disease had been noted in the state for several years.

COTTON

Wilt caused by Fusarium vasinfectum.

Fusarium wilt is causing considerable loss in most cotton-growing states, according to reports received.

North Carolina: The most destructive and widespread disease of cotton in this state, being found in all counties where cotton is grown. (Foster, September 1).

South Carolina: Quite abundant, especially in the lower sections of the state, but is present in the Piedmont as well. (Ludwig, September 1).

Louisiana: Common as usual, and in about the same amount. (Edgerton, September 1).

Mississippi: Present again this season in many parts of the state, especially on sandy loam soils. Damage at least 5% for the state. (Neal, September 1).

Texas: Much dead cotton is seen in fields, due to wilt or root rot, but nearly all of this has fruit upon it. (Bur. Markets & Crop Est. Crop Notes, week ending August 20).

Arkansas: Already killing cotton in some fields. (Elliott, July 1).

Very destructive in some places, scattering infections have been found almost over the entire cotton-growing section of the state. Report of 20% killing of plants in fields of northeastern Arkansas. (Rosen, September 1).

Angular leaf spot caused by Bacterium malvacearum.

Angular leaf spot is said to be the most serious disease of cotton in Arkansas.

South Carolina: Infection heavy in some places and very light in others. In general the infection is light where the weather has been dry, especially if delinted seed was planted. (Ludwig, September 1).

Louisiana: Very common. In some localities has caused considerable shedding of the leaves. (Edgerton, September 1).

Mississippi: Angular leaf spot, while of minor importance over the state at large, has been reported and specimens have been received and identified on August 1 from Lowndes County (Columbus, Mississippi). This particular grower states that the disease is causing 25% damage as a result of a very severe boll infection, resulting in a high percentage of nonmatured bolls and low grade cotton. He also states that this car of seed was bought and shipped into the state from South Carolina. (Neal, September 1).

Arkansas: General and severe. Our most serious disease. (Elliott, July 1).

Very general to severe. Initiates 75% of boll rot in this state, also severe on leaves. (Elliott, September 1).

Anthracnose caused by Colletotrichum gossypii.

Except in Louisiana, anthracnose is said to be causing only locally severe damage.

Tennessee: (Vicinity of Chattanooga) Two fields examined; one field slightly affected, damage probably about 3%; the other field severely affected, the damage at present is about 10%, eventually will be amounting to about 20%; the disease is especially conspicuous in the lower parts of the fields. (Sherbakoff, August 11).

North Carolina: Not so common this year except in counties in southeastern part of state. There rainfall has been abundant. (Foster, September 1).

South Carolina: Present. Extent of injury unknown. Infection does not usually develop to its greatest till September. (Ludwig, September 1).

Louisiana: Very common and doing considerable damage. (Edgerton, September 1).

Mississippi: Anthracnose is of minor importance again this season over the state at large. This fact is, no doubt, due to the dry weather which has prevailed during the greater part of the growing season. This is an important disease in the Delta section in periods of abundant rainfall. (Neal, September 1).

Arkansas: Not general but severe in some fields, usually traced to source of seed. (Elliott, September 1).

Malnutrition (non-parasitic).

Tennessee: Some rust reported but no serious damage. (Bureau of Markets and Crop Estimates Crop Notes, week ending August 13).
North Carolina: Found in localities where fertilizers were not used. Several fields found showing typical potash hunger. (Foster, September 1).
South Carolina: Rather more common than usual, owing to the tendency of farmers to use less fertilizer during the money stringency. (Ludwig, September 1).
Louisiana: No reports and have not noticed any around the state. (Edgerton, September 1).
Mississippi: Only a very small amount observed or reported this season. (Neal, September 1).
Arkansas: Common on poor soils. (Elliott, September 1).

Root-knot caused by Heterodera radicicola.

Root-knot is commonly reported, but does not appear to be the cause of much damage this season.

North Carolina: Common over entire cotton section of state, but no reports of serious nature this season. (Foster, September 1).
South Carolina: One or two inquiries. Apparently not as serious as wilt, unless associated with the latter. (Ludwig, September 1).
Mississippi: No reports of root-knot this season. Apparently of little economic importance. (Neal, September 1).
Louisiana: No reports. Nematodes do not seem to injure cotton much in Louisiana. (Edgerton, September 1).
Arkansas: Rather common and often severe. (Rosen, September 1).

Black rust caused by Alternaria sp.

Arkansas: Completely defoliates some cotton following angular leaf spot, severe in western part of state. (Elliott, September 1).

Leaf spots caused by Cercospora sp. and Ramularia sp.

South Carolina: In a few places leaf spots are abundant but appear to have followed some weakening, due to soil or weather conditions. (Ludwig, September 1).

Blight (cause unknown).

South Carolina: In July a spot of a few rods extent occurred on a farm in Oconee County. In this area practically every stalk was destroyed. The cause has not yet been determined, but would appear to be fungous in origin. (Ludwig, September 1).

TOBACCO

Angular spot caused by Bacterium angulatum.

Kentucky: Angular leaf spot is widespread over the state but is not causing the serious losses of 1921. Until recently the season has been very dry with very little plant growth. Following the first rains tobacco grew very rapidly, producing a clean leaf. In a few places there has been considerable infection; following heavy rains with wind, in tobacco which is nearly mature. (Valleau, September 1).

Wildfire caused by Bacterium tabacum.

Massachusetts: Very serious in seed-beds and from these it was carried to many fields where from 2-20% was reported. All field infections were traceable to infected seed-beds. (Osmun, September 1).

Connecticut: Wild fire, a new disease in the state last year, did considerable damage. Saw a few fields almost ruined. One farmer lost his entire crop of 21 acres. Generally distributed in the Connecticut Valley north of Hartford. (Clinton, September 1).

Kentucky: Much less prevalent than angular leaf spot and causing comparatively little injury. (Valleau, September 1).

Root rot caused by Thielavia basicola.

Connecticut: Not so injurious as in some seasons, but present and cutting down yields in some fields. (Clinton, September 1).

Kentucky: Tobacco root rot is prevalent throughout the Burley section causing uneven stands. These are considered generally by the growers to result from replanting and variable soil conditions, but in several cases it has been demonstrated through the use of resistant strains that the chief cause is root rot. We are testing five strains of resistant "Stand up" Burley in several sections of the state. During the hot dry summer susceptible tobacco on badly infested ground made very little growth but since the rains and cooler weather of the past two weeks it has grown rapidly. (Valleau, September 1).

Wisconsin: Less damage from Thielavia than in years, due to high soil temperatures. Old infested field at Experiment Station shows only about one-tenth as much injury as in normal seasons, although Thielavia is still doing considerable damage on most susceptible varieties. (J. Johnson, September 1).

Mosaic (cause undetermined)

Leaf spotting caused by mosaic is reported from Kentucky and Wisconsin where the disease is apparently doing more damage than usual. A leaf disease of unknown origin, which is perhaps an unusual form of mosaic, also occurs in Kentucky, according to Valleau.

Massachusetts: About the usual amount. (Osmun, September 1).

Connecticut: Perhaps more common than usual; at least seen in many fields, but rarely very serious. (Clinton, September 1)

Kentucky: Mosaic in Burley tobacco is more prevalent than usual. It is causing damage not only from the dwarfing and loss of weight, etc. caused by typical mosaic, but a death of large areas of the lower leaves of mosaic plants is very common and destructive. This appears first as a speck or spot one-half or two-thirds of the distance from the base of the leaf. The area between the spots gradually dies leaving a large dead area often covering as much as 36 square inches. In its early stages this is often mistaken for angular leaf spot. This has also caused considerable damage in the Dark section. The relationship between this type of injury and mosaic is not generally recognized by the growers.

A disease of tobacco, the cause of which is not known, has been observed for the past two seasons. The later stages appear as dead lines in the leaves, often making very striking patterns. It is common both in Burley tobacco and in the dark district. The early stages appear as light colored lines identical in color with the light areas of mosaic blending into the normal green. These may form a series of small rings or be portions of larger rings thus forming nearly straight lines terminating at large veins. A few leaves in the early stages have been observed completely covered with patterns identical with the so-called Liesegangs rings of the chemist. There is a possibility that this may be one of the manifestations of mosaic but the young growth from plants so affected has shown no signs of mosaic. (Valleau, September 1).

Wisconsin: An unusual amount of mosaic this year, probably on account of high temperatures favoring progress of disease. Mosaic followed by death of parts of leaf, i. e. leaf spotting, called "rust" by farmers but distinguishable from spots caused by known parasites and other non-parasitic spots. (J. Johnson, September 1).

Hawaii: I found mosaic prevalent in South Koua. (Kunkel, L. O. News Notes, Office of Cotton and Truck Disease Investigations, August 6, 1921, page 7).

Leaf wilt (cause unknown).

A leaf wilt of unknown cause has been reported from Kentucky. The Plant Disease Survey would be interested in knowing whether similar troubles have been observed in other states. Regardings symptoms of the disease, Valleau reports as follows:

"A tobacco leaf wilt disease is quite prevalent. It appears sometimes as a wilt of the entire growing plant, the leaves dropping badly but occasionally recovering. In other cases it appears on the larger leaves, generally near the top of the plant, causing a wilt of a portion of the leaf. In this wilted area there are generally large brown spots which give the appearance of cured tobacco. The immediate edge of the brown spot is bordered by a narrow bluish green line and beyond this there may be an area of an inch or more of light yellowish green. The injured areas in such leaves generally do not recover, but eventually dry up including some tissue surrounding the injured portion. It is generally believed by the growers that this injury results from the sting of the stink bug, but they have no evidence of this point. In some fields this disease is causing about .1 of 1% injury. It was noticed last year to some extent, but according to the growers it is very much more prevalent and destructive this year than in any previous year."

Bacterial leaf spot caused by unnamed organisms.

Wisconsin: Symptoms similar to wildfire but less virulent. Not a serious disease in recent years. Probably the old-fashioned rust. Found in several fields but causing no serious damage. (J. Johnson, September 1).

"Streak disease" apparently an undescribed trouble, resembling the streak disease of potato, was reported by L. O. Kunkel (News Notes of the Office of Cotton, Truck, and Forage Crop Disease Investigations, August 6) as the most serious tobacco disease in the vicinity of South Koua in Hawaii.

Lightening injury. A tobacco field about eight miles south of Janesville, Wisconsin was struck by lightening, killing an area of young tobacco about three rods in diameter. Many plants were killed outright; the plants at the edge were partially injured. (J. Johnson, September 1).

Library, U
U. S. Department of Agriculture,
Washington, D. C.